

## ABERRANT REPRODUCTIVE BEHAVIOR PATTERNS OF DRAGONFLIES IN HUMAN-IMPACTED HABITATS<sup>1</sup> (ODONATA: LIBELLULIDAE)

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**ABSTRACT:** Aberrant male territorial and female ovipositional behavior is described for the dragonfly, *Libellula croceipennis* Selys, in human-impacted habitats.

**DESCRIPTORS:** Dragonfly, behavior, territoriality, oviposition, *Libellula croceipennis*, artificial habitats.

Many animals possess behavior patterns shaped by generations of natural selection that result in aberrant behavior in habitats modified by human activity. This note chronicles two such behavior patterns concerning a brilliant red dragonfly, *Libellula croceipennis* Selys, as observed in a highly urbanized section of Austin, Travis County, Texas.

### Territorial Defense of a Wading Pool

During a six-week period from 2 August-15 September 1970 an adult male specimen was observed numerous times perched on a clothes line located about 1.6 m above a wading pool (2 m in diameter, 0.4 m in depth). All observations concerned a single individual, identifiable by a missing left prothoracic leg. Perching (with drooped wings) occurred at various times of the day in contrast to the "quite constant" arrival times of *Perithemis tenera* (Say) at various perch sites (Jacobs 1955). Patrolling of the intermediate area around the pool was also observed. No other *L. croceipennis* individuals were observed at the pool. On one occasion the dragonfly was observed to leave immediately upon arrival at a time when the pool contained no water. Such behavior may indicate that the pool was sought for actively by means of visual landmarks; however, if water was not detected (visually or hygrially), flight continued to the next stop on the daily patrol route. Contrary to previous reports that territorial aggression was not used inter-specifically (Moore 1964), this individual was observed to chase away much smaller damselflies. However, possible territorial behavior by a "large dragonfly" against a butterfly has been reported (Manley 1971).

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No detailed data are available for typical habitat of this dragonfly. Needham and Westfall (1955) report "ponds and streamside pools" as typical nymphal habitat for species of the genus *Libellula*. Personal observations of this species indicate that shaded slow-moving creek waters (and periodically isolated pools) are frequented by adult *L. croceipennis*. Needham and Westfall (1955) record this species from Oklahoma, Texas and Baja California south to Costa Rica. The nearest typical habitat was only 350 m from the wading pool.

The behavior of this individual may have resulted from several factors. Preference by adults for waters similar to that experienced during nymphal period is known for some odonates (Johnson 1966). Moore (1962) reported abnormal habitat selection (salt marsh pools shown to be unsuitable) during times of high population levels. Relative population levels of *L. croceipennis* at the time of these observations are unknown, but overcrowding as a result of drought (resulting in decreased water surface area) may have been a factor.

Territoriality in dragonflies aids dispersal which reduces overcrowding in restricted breeding areas (Kormondy 1961; Moore 1957). If this individual were driven out of normal habitat, it may well have been an "inferior" male. The varied times of arrival of this individual is a further indication that these observations may have involved an "inferior" male.

### Attempted Oviposition on Glass Surface

On 15 September 1970 I observed a female *L. croceipennis* performing typical ovipositional thrusts with its abdomen toward and touching windshield glass of parked automobiles. At times several dips in succession by an individual were observed. These observations were made in a sizable parking lot located adjacent to a creek (a four-lane street separated creek and parking lot). The particular cars involved were 40-60 m from the wooded edge of the creek at which adults are commonly observed. Quite apparently these females had mistaken the reflective surface of the glass for a water surface.

Previous records of similar mistakes concerning other surfaces by female dragon flies have been reported. Kennedy (1938) reported that pool-breeders were attracted to shining surfaces such as an automobile roof and a petroleum pool. Many *Anax junius* (Drury) are killed in California oil pools (Kennedy 1917). Muller (1937) reported female *Orthetrum* laying eggs on shiny cement floors in Java. Neville (1960) reported *Pantala flavescens* (a tropical small pool breeder) showing sexual behavior and ovipositional movements over an automobile roof and tents.

Dragonflies respond visually to highly reflective surfaces, but antennal sense organs may determine the suitability of water type for oviposition (Corbet 1962). Observations reported herein indicate that visual stimuli may overcome lack of stimulus of antennal receptors in *L. croceipennis*.

### Conclusion

Human impact upon natural populations of animals is usually considered in terms of severe reduction or extirpation of local populations. However, many species are able to exist in small microhabitats and/or adapt to artificial habitats. As seen in these observations, aberrant results occur as finely-tuned adaptations which evolved under natural conditions but are utilized in unnatural conditions.

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